51-6

A.D. 1898. JUNE 27. Nº. 14,205.
SMITH'S COMPLETE SPECIFICATION.

BRITISH
Name Smith
Date June 27, 1898
Number 14,205

1898

Fig: 1

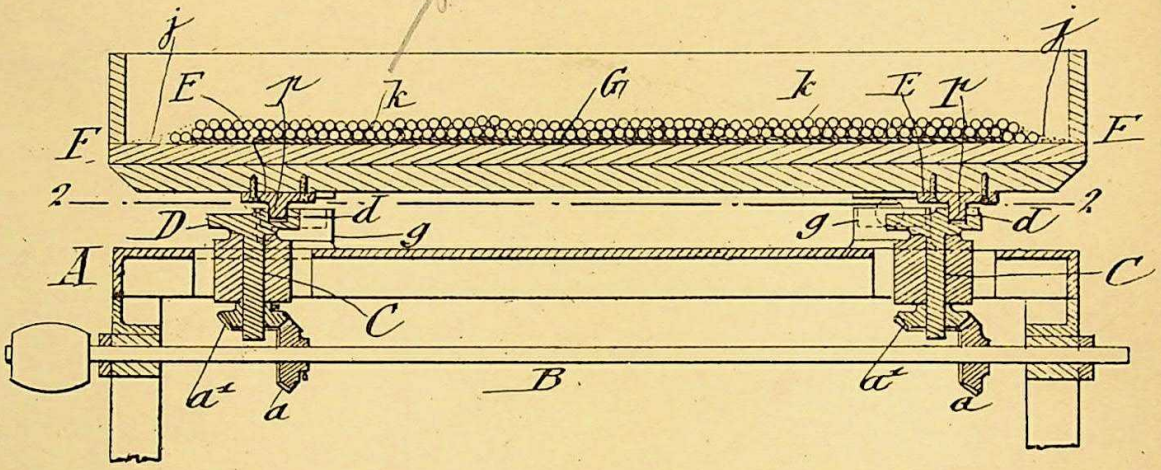
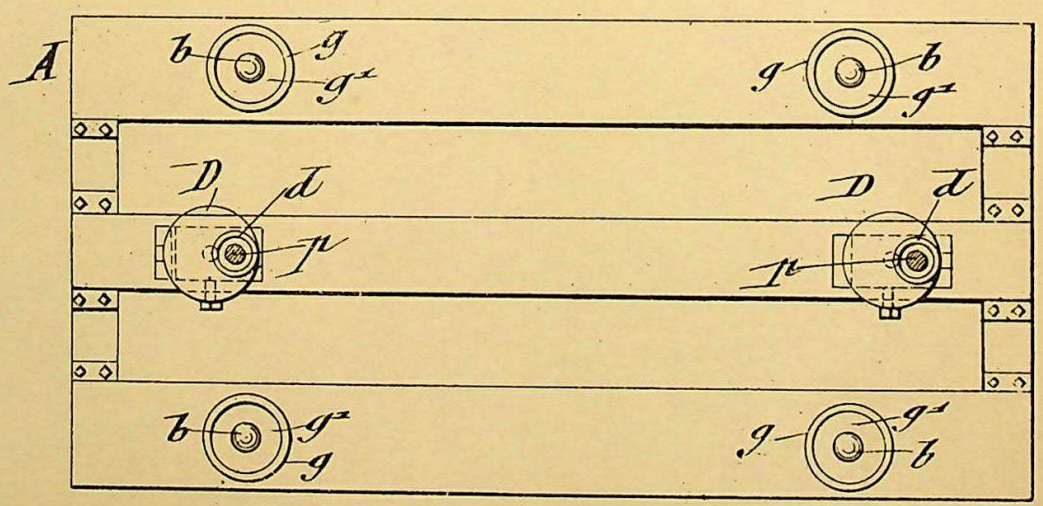


Fig: 2.



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(2 SHEETS)

SHEET 2.

Fig: 3. Metal Pen

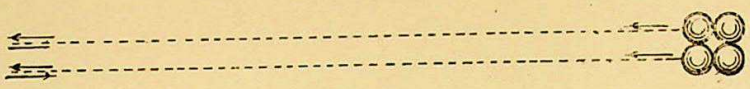


Fig: 4.

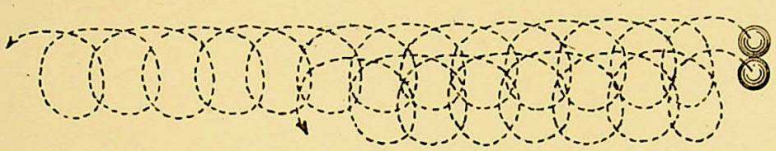


Fig: 5.

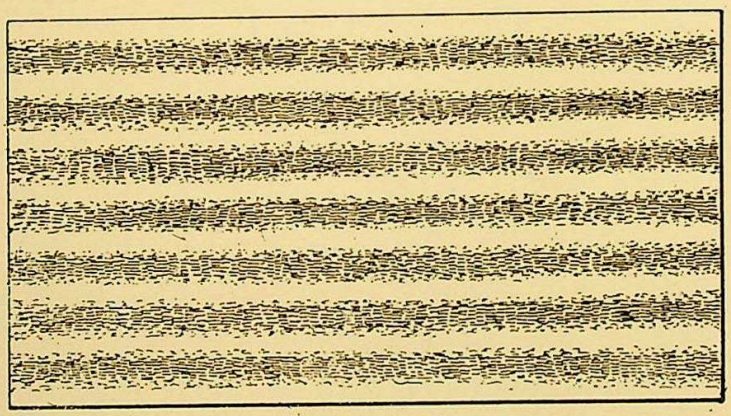
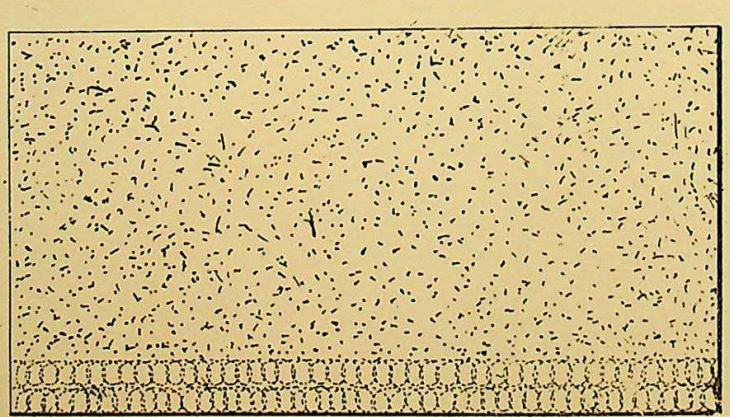


Fig: 6.



[This Drawing is a reproduction of the Original on a reduced scale.]

Malby & Sons, Photo-Litho.

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SEP 1898

51. Grinding & Polishing.
Metal.
Plane Surfaces.

Metal Plane.

27

Metal Plane

N° 14,205 A.D. 1898

DUPLICATE

Date of Application, 27th June, 1898—Accepted, 10th Sept., 1898

COMPLETE SPECIFICATION.

Improvements relating to the Preparation of Plates for Printing.

I, JAMES HENRY SMITH, of No. 102, Westfield Street, Providence, Rhode Island, United States of America, Lithographer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to processes of graining the plates employed for surface printing, the object of the invention being to produce a plate having the required even and uniform grain for receiving in the most perfect manner the design, picture or the like to be drawn or transferred onto the grained surface of the plate.

The graining of plates employed for surface printing has in some cases been performed by reciprocating the plate under the action of a suitable quantity of sand and abrading balls placed on the upper surface, whereby the plate is grained. The object of thus graining the plate is to remove the case-hardened surface, that is to say the surface which comes in immediate contact with the rolls of the rolling machines and is thereby hardened, while the interior of the sheet still retains its cellular or grain-like structure. Said method of graining is a decided advance over moving a stone or other abrading object in contact with the hardened surface, as the grained surface is left, and the grains or cells are not destroyed or flattened down materially. Experience has proved that by reciprocating the plate as in the above mentioned process, the abrading balls which are supported thereon are caused to move in longitudinal parallel lines throughout the length of the plate, thus cutting into or abrading only portions of the plate in a longitudinal direction and not removing the hardened surface of the plate which is not subjected to the direct action of the abrading balls. The objection was also encountered, that the sand which is necessary for obtaining the proper abrading action tended to bank up towards each end of the plate so that the hardened surface of the end-portions of the plate were not as well treated as the intermediate portions.

The present invention is intended to effectually and thoroughly remove the entire hardened surface of the sheet so that a perfect, even, and well-grained surface throughout the plate is obtained.

An apparatus for producing this result is shown in the accompanying drawing, in which

Figure 1 represents a central vertical section of the machine.

Figure 2 is a horizontal section on the line 2—2, Figure 1.

Figure 3 is a diagrammatic view showing the course of movement of the balls in the old method.

Figure 4 is a diagram, showing how the balls move in the present invention.

Figure 5 shows a reproduction of the surface of a metallic sheet made in accordance with the old method, and

Figure 6 shows a reproduction of the grained surface made by the present process.

Similar letters of reference indicate corresponding parts.

[*Price 8d.*]

Smith's Improvements relating to the Preparation of Plates for Printing.

Referring to Figures 1 and 2, A represents the frame work of the machine used in my process, B the driving-shaft, a, a^1, intermeshing bevel-gears, of which there are two pairs, C indicates upright shafts journalled in suitable bearings in the frame and which carry said bevel-gears, and D represents the crank-discs at the upper ends of the shafts C, said discs being provided with crank-sockets d arranged at one side of the axes of the shafts C. These crank-sockets d receive pins p extending downwardly from plates E which are fixed to each end of the bottom of the tray or bed F, so that upon turning the shaft B a circular shaking motion will be imparted to said bed, upon which the zinc or other plate G to be grained is fastened. The bed F is supported upon four anti-friction balls b which are held in depressions of the discs g, a steel-plate g^1 being arranged at the bottom of the said depressions for the balls D to roll upon. The zinc plate G is secured to the bed in any suitable manner, and a quantity of sand j is placed upon the same together with a large number of balls k preferably made of glass, and termed abrading balls. The rotary motion of the bed F is such that every point thereof describes during the rotation of the bed concentric circles around an imaginary centre, and this motion causes the abrading balls k to also revolve in circles or spiral and serpentine paths, see Figure 6, and to also turn around their own axes with an action similar to the sun and planet gearing, so that the said balls will describe intercrossing circles upon the surface of the zinc plate. The motion of the balls in connection with the cutting action of the sand and the assistance of the water will cause the hardened surface of the zinc or other plate to be evenly and properly removed throughout, thus producing a printing-plate, the drawing or transfer surface of which is perfect for the object for which it is intended. By the peculiar movement, therefore, of the balls, and the action of the sand and water on the surface of the plate, the same is perfectly grained.

The perfection of the grained surface of the zinc plate, prepared in accordance with this process, as compared with the old process will be seen by comparing Figure 5, showing the old, with Figure 6, showing the new plate.

The glass balls may be replaced by pieces of felt or similar porous material which gradually becomes charged with sand and thus produces the same effect as that produced by the said glass balls. The pieces of felt have moreover the advantage of producing a very fine grain and a perfectly even surface. The adoption of pieces of felt permits of the production of excellent transfer plates and of dispensing with the use of the nitric acid bath.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

The process of graining the plates employed for surface printing, the same consisting in placing a suitable quantity of sand and a number of abrading balls or pieces of felt upon the surface of the printing-plate to be grained, rapidly moving said plate in a circular path, whereby the balls are caused to travel around the surface of the plate and to move in concentric intercrossing circles or curves, so that by the assistance of the sand the entire surface of the printing-plate is removed and a perfectly grained and even surface is produced throughout, substantially as set forth.

Dated this 27th day of June 1898.

HASELTINE, LAKE & Co.,
45, Southampton Buildings, London, W.C., Agents for the Applicant.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd.—1898.